Upper Dolores Stream Protection Working Group Session 4

18 November 2020 (Citrix based due to Covid precautions)

Today's Discussion/Context

- **Group share, observations upper Dolores summer 2020: Our forests and range lands continue to change**
  - Record wildfires
  - Beetle kill, SAD continue, trigger expanding deadfall
  - Persistent record drought continues to slam our trout populations, snow levels move up
  - Kokanee upstream migration reduced
  - Other?
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- **DNA results/Coal Creek - Jim**
- **Outstanding Waters designation discussion**
- **Moving forward**

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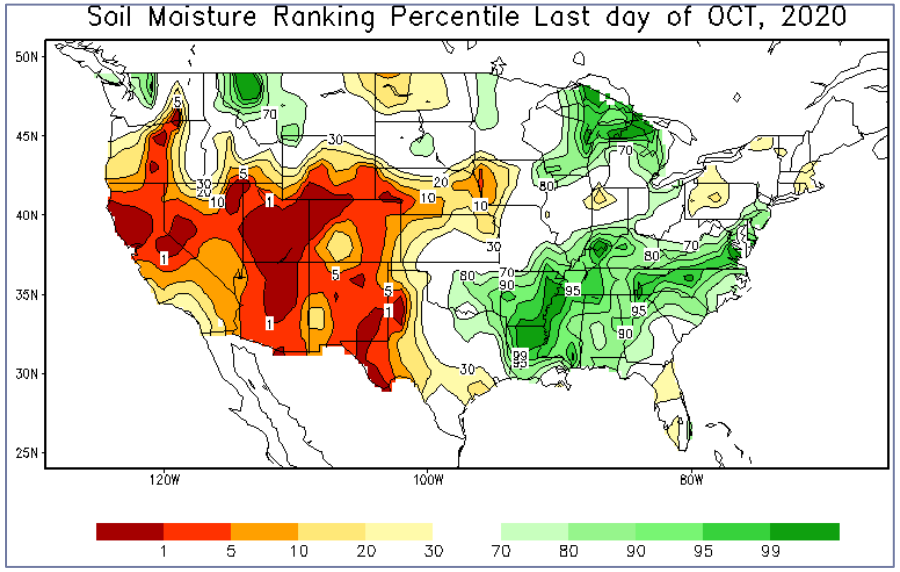
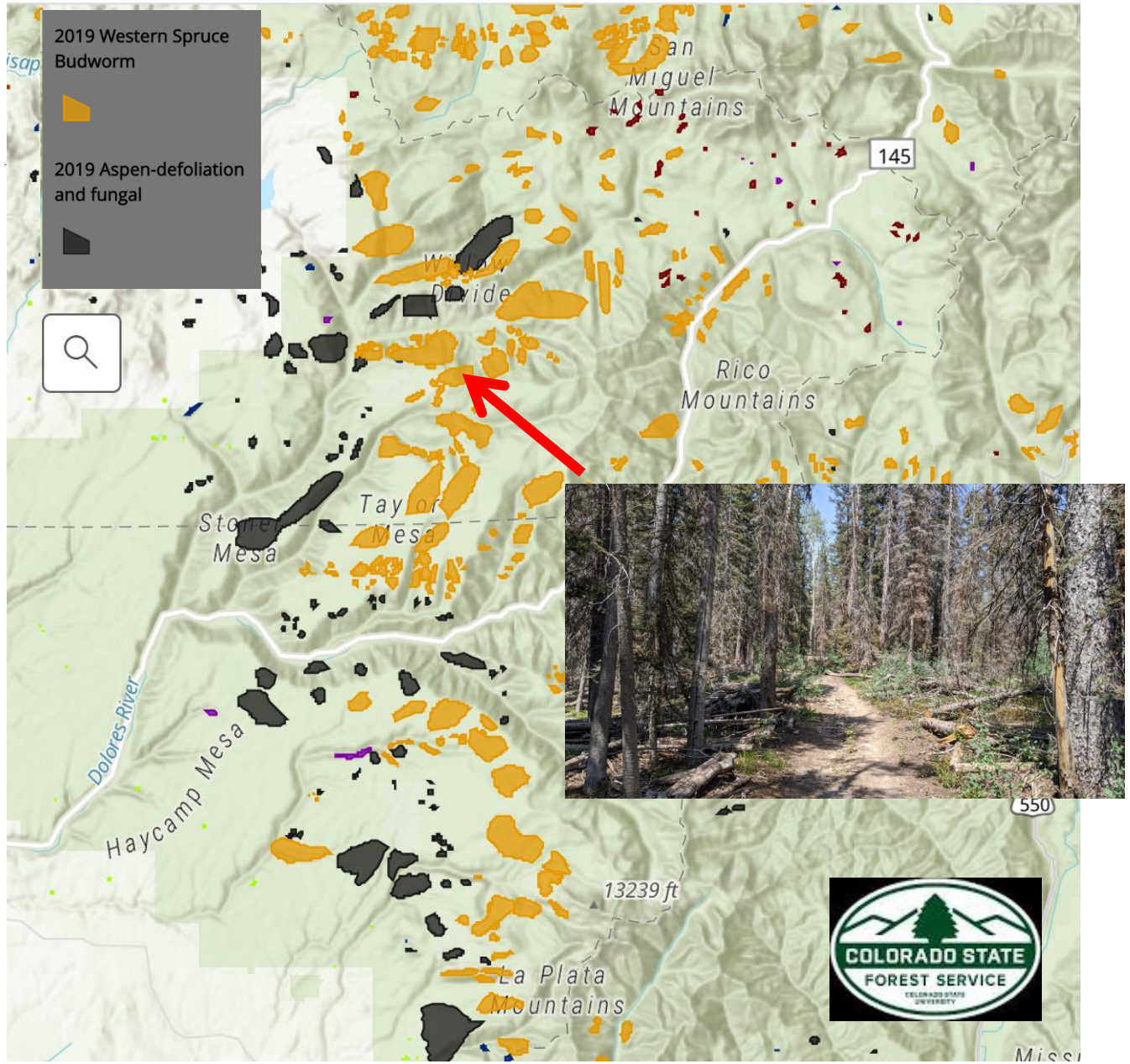
Record acres consumed by wildfire on Front Range

- *Fire are bigger and more intense.* The three largest wildfires ever recorded in Colorado occurred this year (over 575,000 acres burned as of 31 Oct '20).
- *The 20 largest wildfires in Colorado history have **all** occurred since 2002.*
- Soil moistures levels and fuel burn indexes were at record problematic levels as of the mid/end of October.



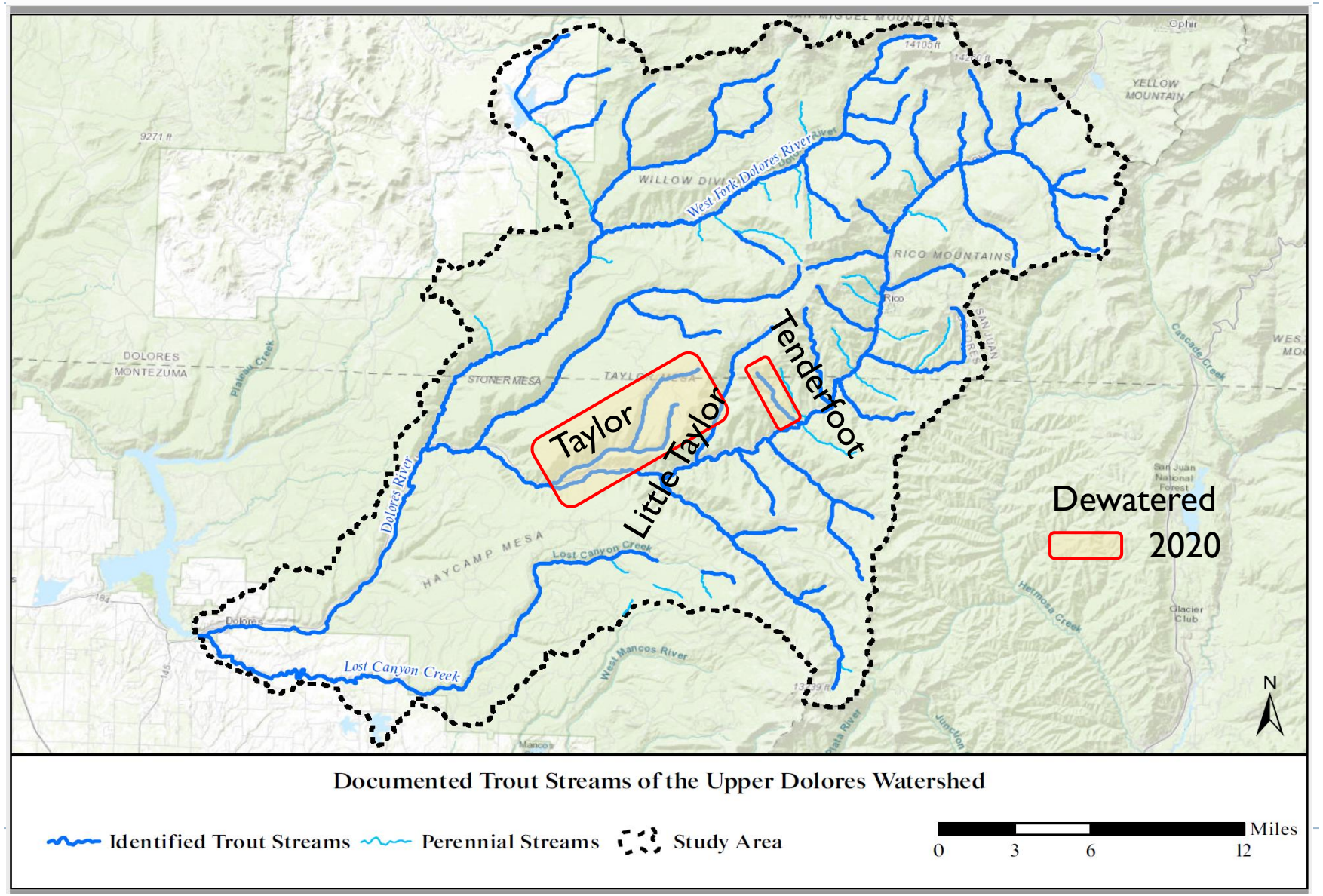
2019 Insect and Disease Update

- Western Spruce Budworm and SAD continue to expand rapidly
- Drought and warmer winters are likely driving the expansion
- Deadfall has increased dramatically

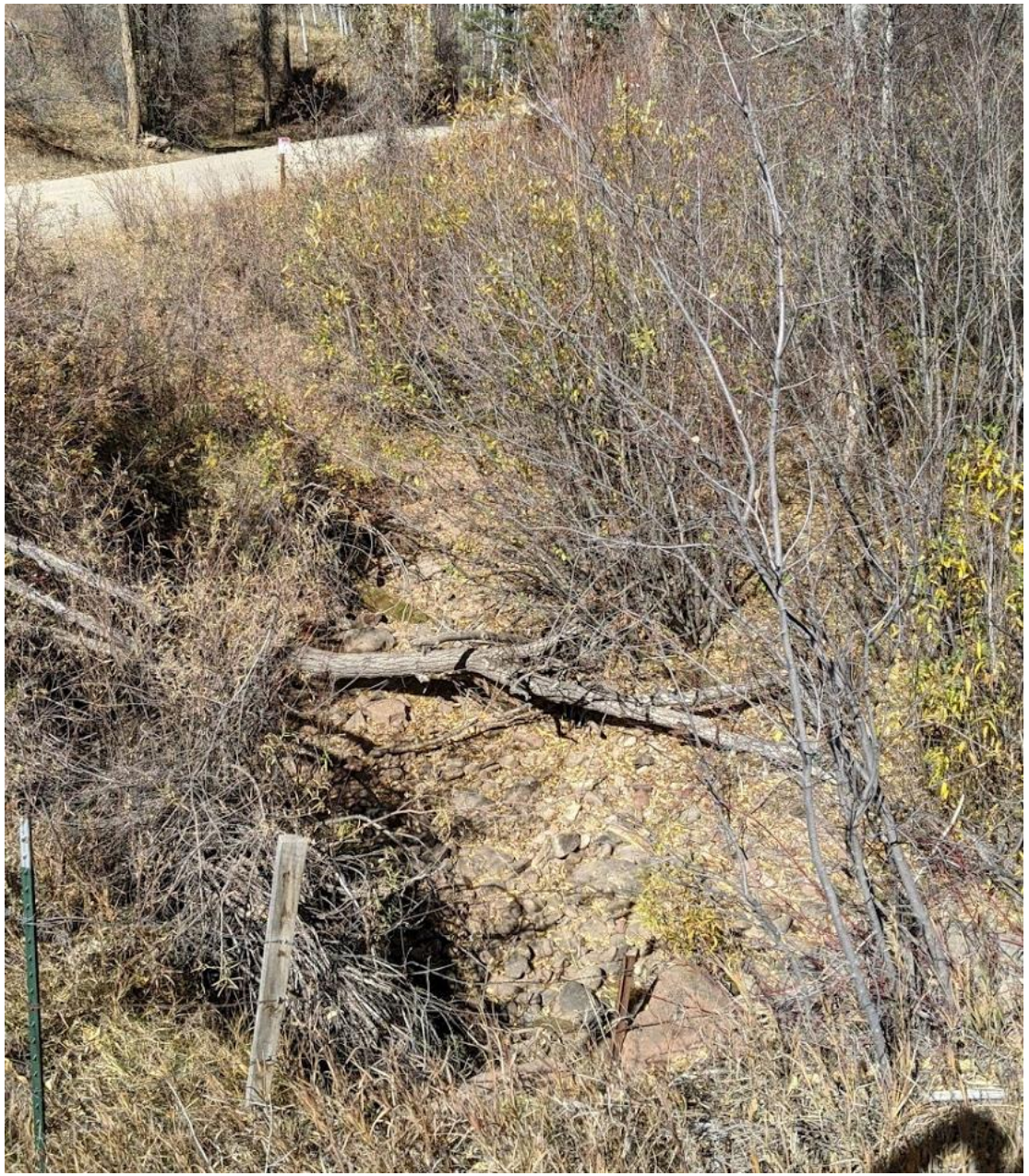


https://csurams.maps.arcgis.com/apps/MapJournal/index.html?appid=7d49022bff5a49a099c63320d421ea36

Taylor, Little Taylor and Tenderfoot Creeks were hammered by drought in 2020



Taylor Creek, mid October @ 145 bridge



Taylor Creek, mid October @ 2013 DRA stream work site

Taylor Creek, mid October @ the horseshoe curve

Taylor Creek, mid October, pocket @ horseshoe

Taylor Creek, mid October, 7 miles up on the mesa

Little
Taylor
Creek, mid
October

Confluence
Taylor & Little
Taylor Creeks,
mid October

Tenderfoot Creek, mid October

Tenderfoot Creek, mid October

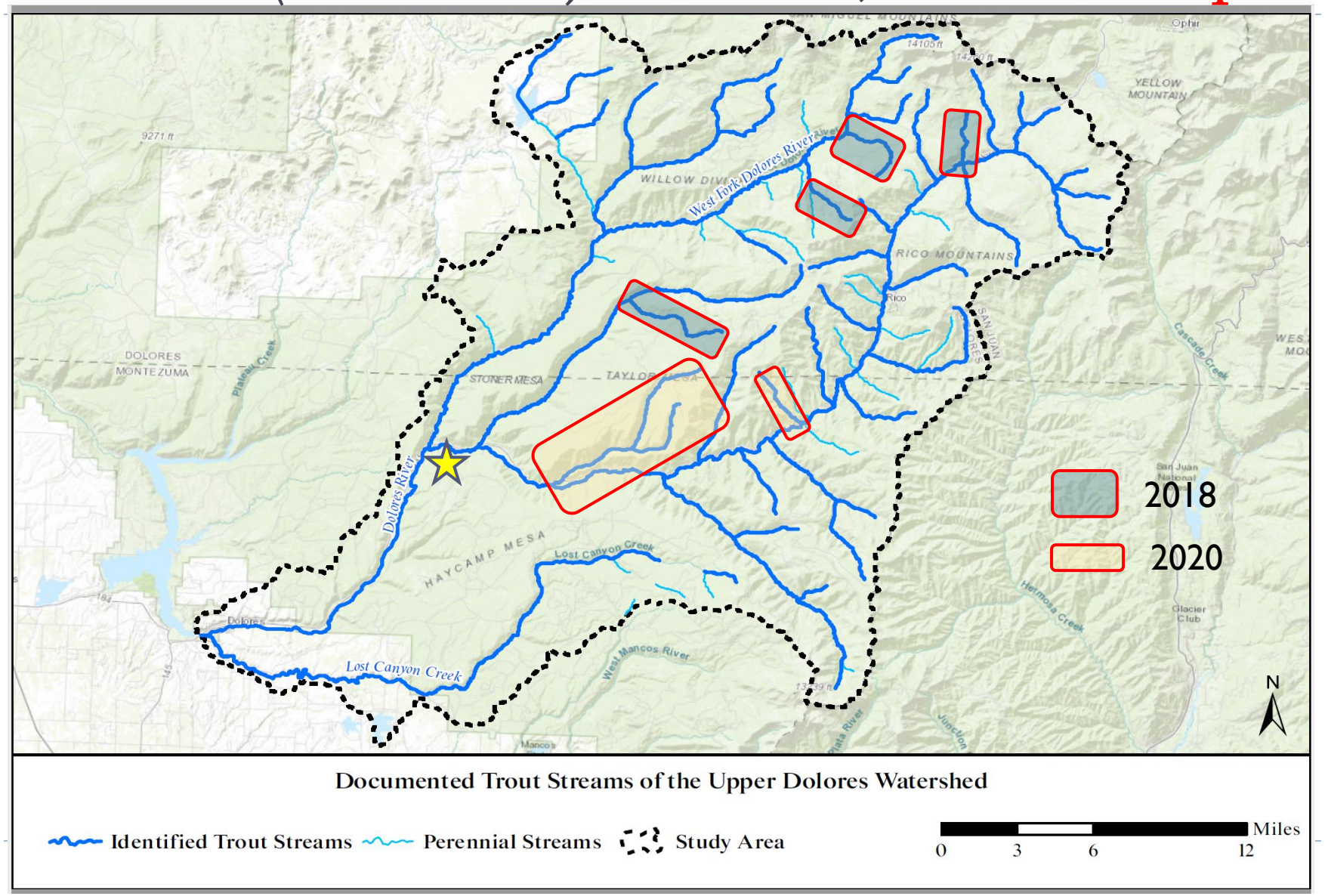
Low water = new challenge: emergent algae!

So it's three streams, what's the big deal?

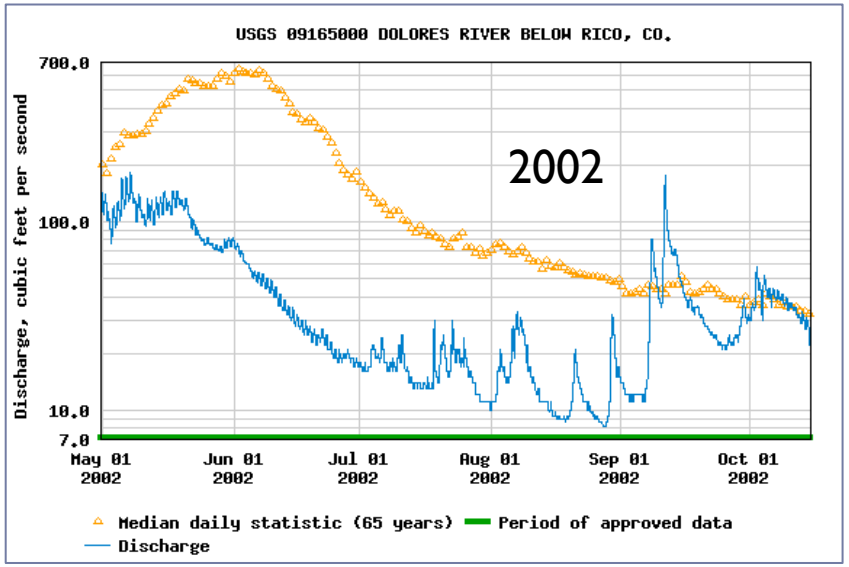
- In 2016 we had 24 trout streams with known cutthroat populations hanging on
- In 2018 we lost (all) trout populations in four creeks
  - Spring Creek
  - Morrison Creek
  - Coke Oven Creek
  - East Fork Fall Creek
- All four were cutthroat streams
- None seem to have yet recovered
- This year we lost
  - Taylor Creek
  - Little Taylor Creek
  - Tenderfoot
- Will they recover..?

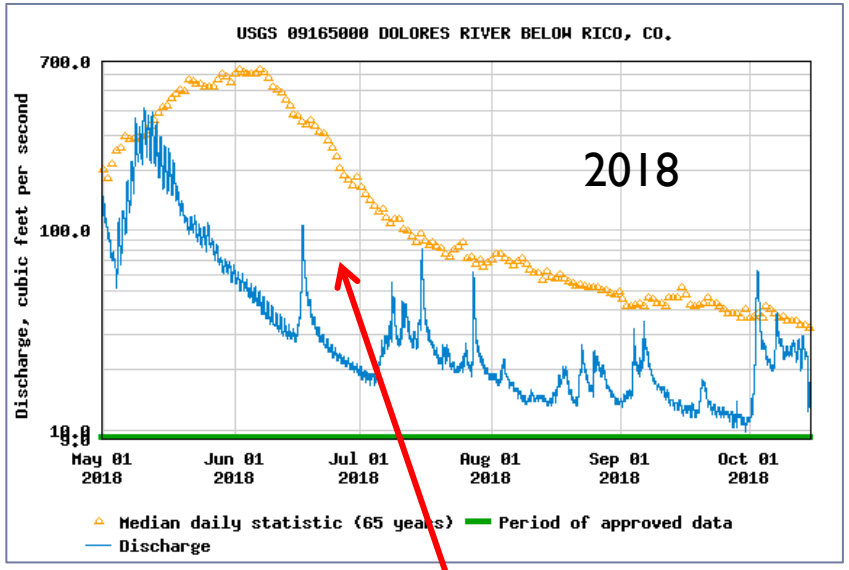
Spring Creek 2018

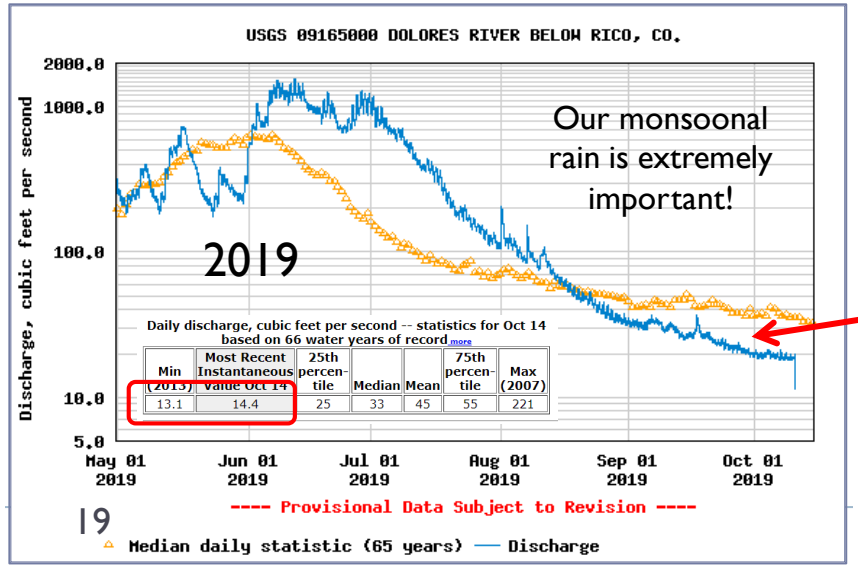
It's now *seven (cutthroat)* streams, is there a pattern?

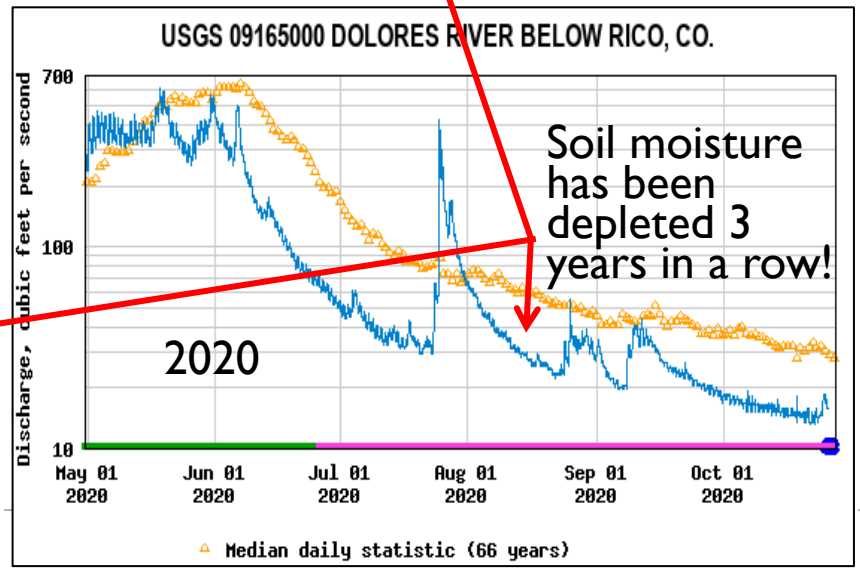


Flow @ Montelores Bridge: snow melt vs monsoon





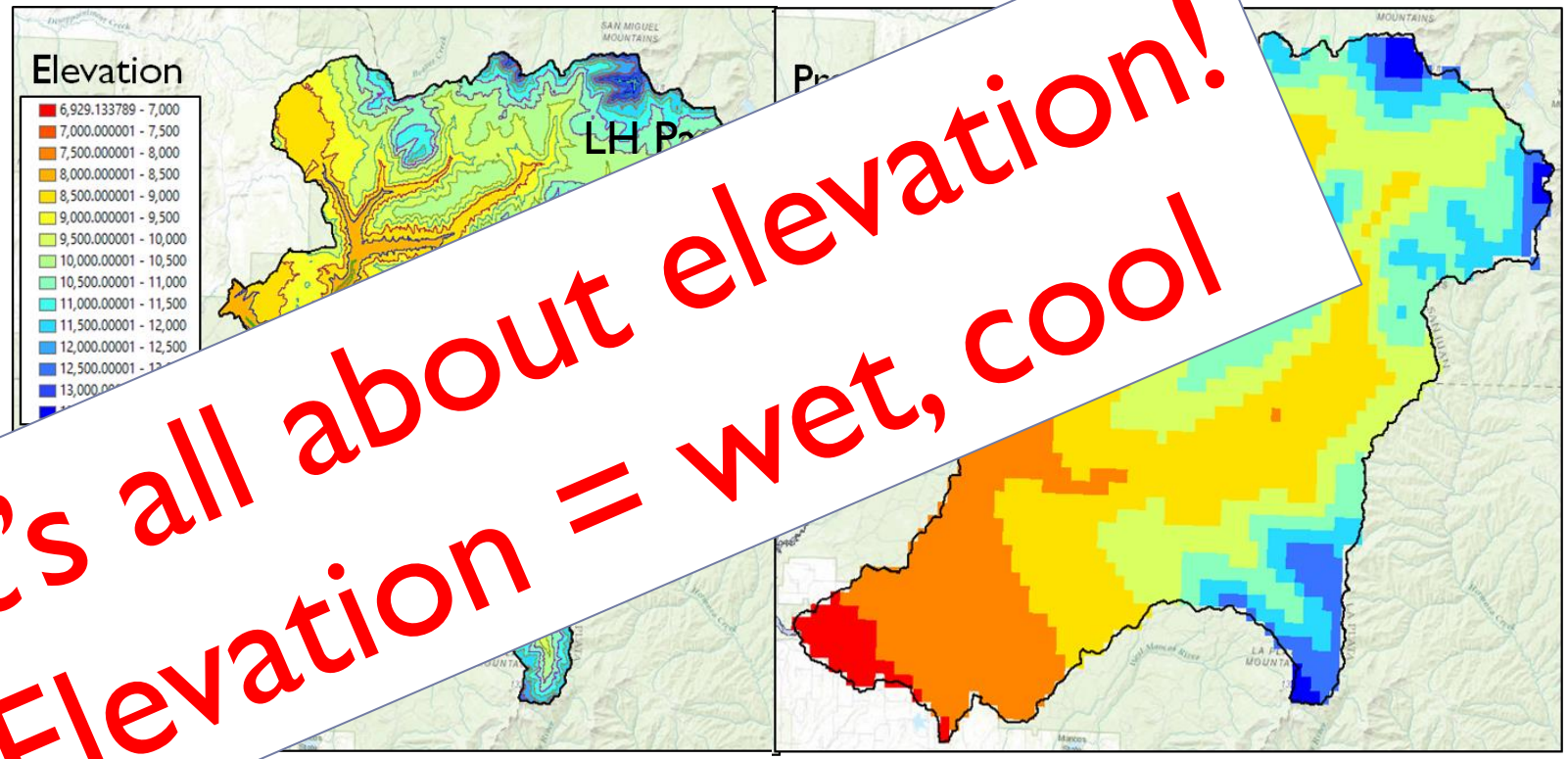




https://waterdata.usgs.gov/co/nwis/uv/?site_no=09165000&PARAmeter_cd=00065,00060

Emerging dewatering pattern, related issues

- Most vulnerable populations
  - Small watersheds
  - Low elevation headwaters
- Lower water levels lead to warmer waters
- Warmer water leads to
  - chronic and acute fish stress
  - less macrobiotic food in the annual cycle
  - poor reproduction
  - algae blooms
- Dewatering is closely related to soil/subsoil moisture, which affects summer base flows



Snowmelt gets it going, monsoon keeps it flowing!

Report on kokanee migration in summer 2020

- Observations from DRA member who lives on the Dolores at West Fork
  - She's lived there for 18 years
  - She has undergraduate degree in natural sciences management
  - Until 2017 she had several hundred kokanee migrate up to her bridge in the first week of November
  - 2018 the number dropped dramatically
  - Last year only a dozen showed up
  - This year, none as of 16 November

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SJNFS Coal and Slate Creek study

SLATE CREEK

Field Review 11/5/2020, Kelly Palmer

Slate Creek is a tributary of the upper Dolores River. Most of the watershed lies within the Lizard Head Wilderness, San Juan National Forest. Slate Creek has been identified as an important long-term refuge stream for fish because it is located at high elevation where stream water is expected to remain cold, and perennial flow is maintained even through exceptional drought conditions.

GEOLOGY

The Mancos Shale comprises 70 percent of the Slate Creek watershed. The lower reach of Slate Creek is confined in a canyon as it flows through the Dakota sandstone, and the stream channel has a high gradient through the Morrison/Entrada/Wanakah Formation as it flows into the Dolores River.

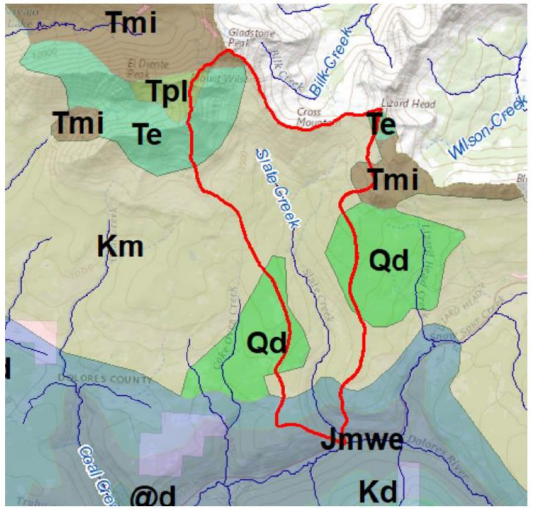

Figure 1. Geology map of Slate Creek watershed. Mancos formation identified by Km, red polygon is Slate Creek watershed boundary.

Land Use

Approximately 82 percent of the Slate Creek watershed lies within the Lizard Head Wilderness where current management activities are limited primarily to recreation and livestock grazing. This watershed is entirely within the Coke Oven pasture of the Coke Oven allotment, an active sheep grazing allotment. Recreation includes, but is not limited to hunting, fishing, and hiking. Limited car camping and mountain biking occur outside the wilderness area.

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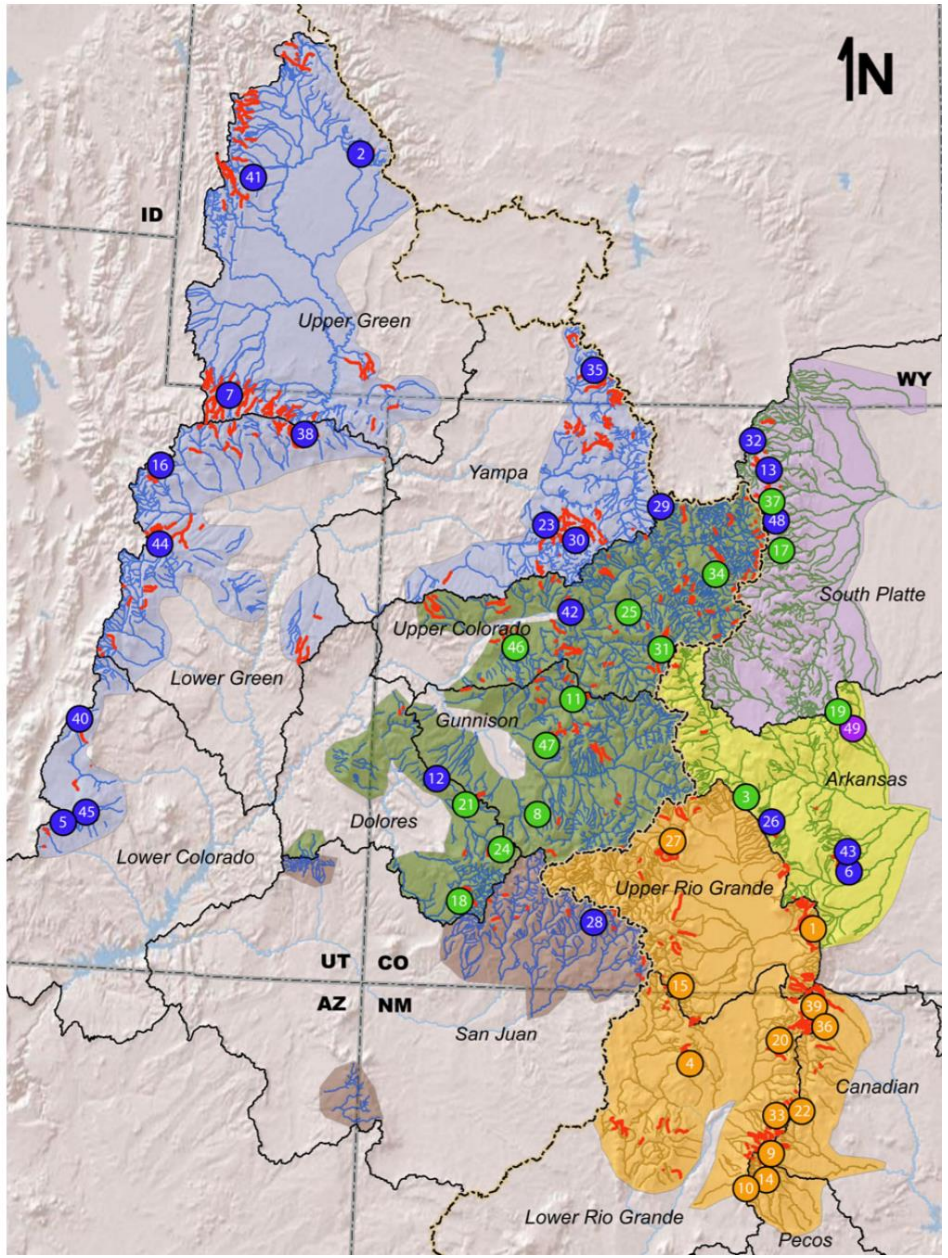
Cutthroat lineage distribution in the Rockies



https://cpw.state.co.us/Documents/Research/Aquatic/CutthroatTrout/Bestgen2019TAFS.pdf

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Upper Dolores Stream Protection Framework

All streams known or feasibly-thought-to-have "permanent" trout populations in upper Dolores

Decision Factors:
Stream's Trout-habitat Resilience State

- Type Trout?
  - CT Only
  - Wild only
  - Mixed: Ct w/Wild
- Resilience to de-watering
  - Drought
  - Elevation
- Resilience to stream temp warming
- Resilience to wildfire including erosion/debris effects
- Resilience to natural erosion
- Resilience to flash flooding
- Resilience to developmental/ recreational use pressure

Working List of State, Federal and Local Stream Protection Tools

I. State Protection Mechanisms
- A. Colorado Instream Flow and Natural Lake Level Program
- B. Colorado Law and Intergovernmental Agreements
- C. Gold Medal Waters
- D. Outstanding Waters
- E. Stream Management Plans (SMPs)
- F. CPW/NFS - Fishing Regulations
- G. CPW/NFS - In/near/associated-stream intervention techniques

II. Federal Protection Mechanisms
- A. U.S. Forest Service ("USFS") Land Management Plans ("LMPs").
  - 1. Management Area Designations (MA 1, MA2, M3)
  - 2. Special Areas and Designations:
    - a. Area of Critical Environmental Concern
    - b. Wildlife Management Area
  - 2. Conservation Watershed Network for Native Fishes
- B. Wild and Scenic Rivers Act of 1968 ("WSR)
- C. Wilderness Designation: Wilderness Act of 1964 ("Wilderness Act")
- D. National Conservation Areas ("NCAs")
- E. Federal Research Areas
- F. Other Federal Legislation (special)
  - 1. (Rio Grande and North St. Vrain Creek)
  - 2. South Platte Protection Plan (WSR suitability determination held in abeyance).
  - 3. Rio Chama Management Plan

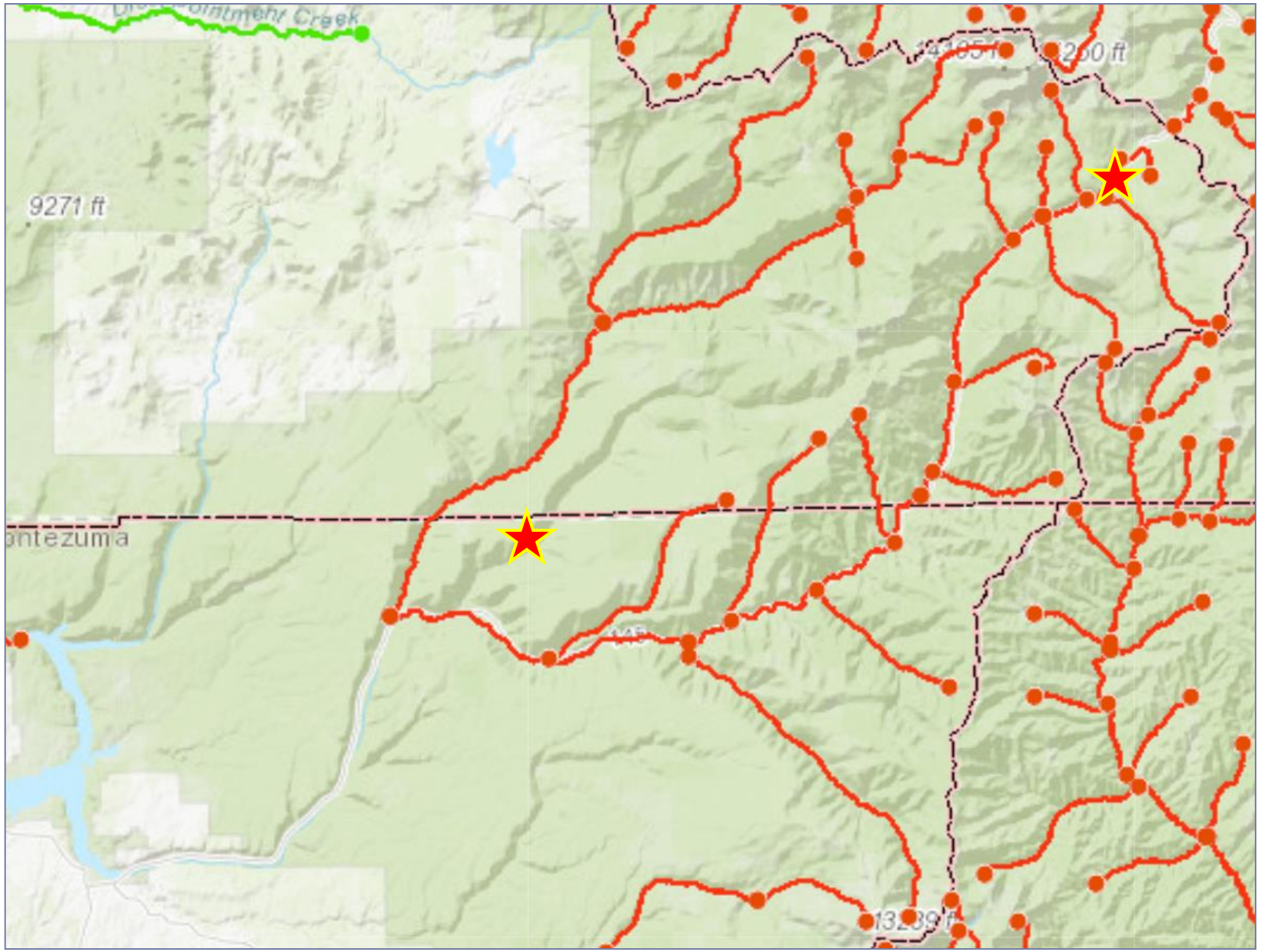
III. Other
- A. Conservation Easements
- B. County Land Use Codes

C. Contractual Arrangements

In-stream Flow

Output Table: Trout streams with a recommended protection strategy for each stream as needed

In-stream flow decrees currently in place in the upper Dolores already cover all but Stoner and a small piece of Snow Spur of our nine OW candidates



https://gis.colorado.gov/dnrviewer/Index.html?viewer=mapviewer

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Outstanding Waters

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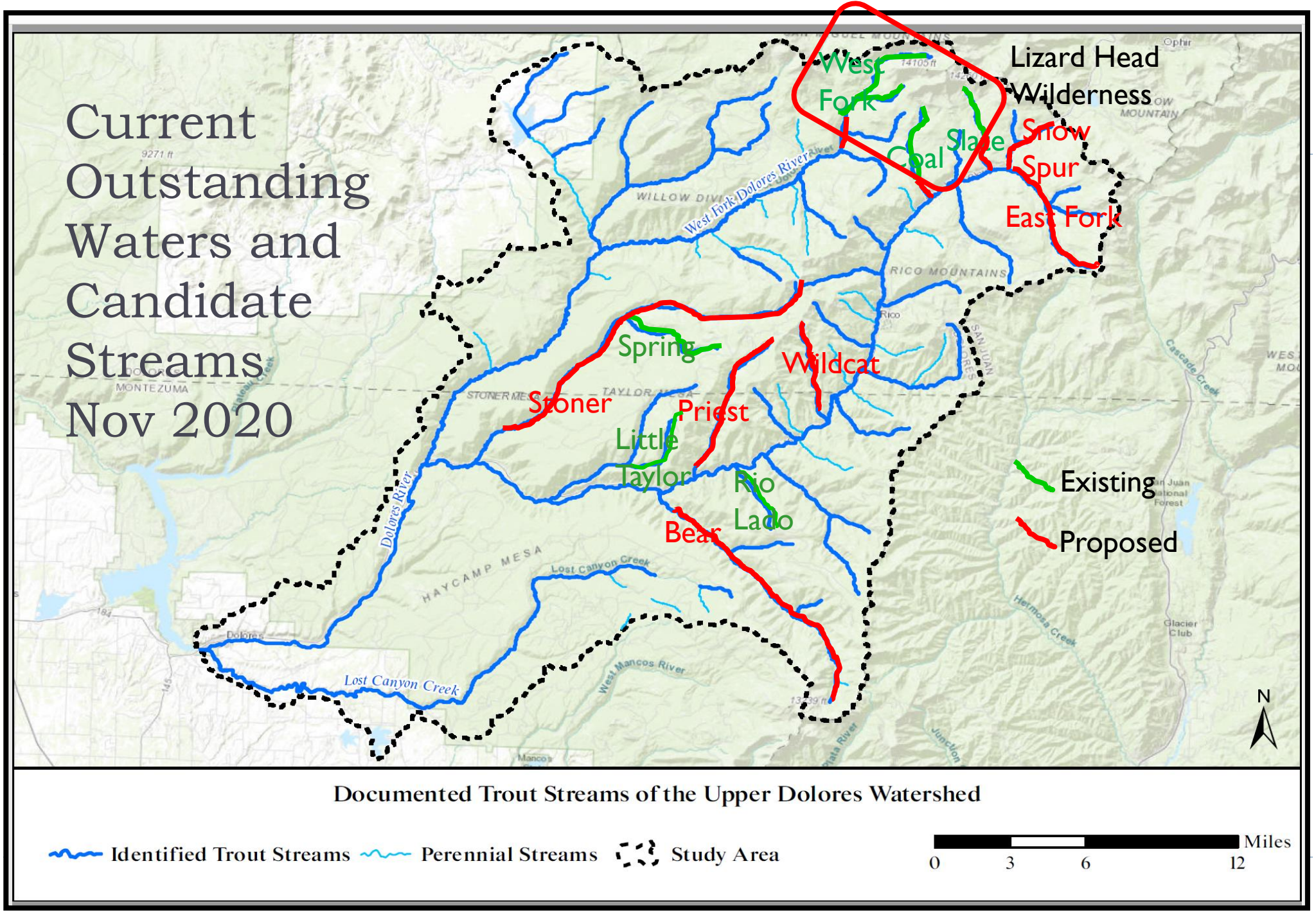
Toolbox: "Outstanding Waters" designation?

- A state designation authorized by the federal Clean Water Act that adds more protection to priority waters that meet very high water quality standards.
- It is "anti-degradation" focused – that is, once designated, future uses cannot degrade the water quality below those high standards.
- The designation is awarded by the Colorado Water Quality Control Commission upon application and after extensive review and public hearings (three year process). The process is "triennial", that is, the State rotates process-initiation annually around three state "regions".
- ***Note: all candidate stream reaches are contained entirely within the San Juan National Forest; that is, no candidate reaches run across or run adjacent to private property.***

Current Outstanding Waters and Candidate Streams Nov 2020



Three tests must be met to be OW designated:

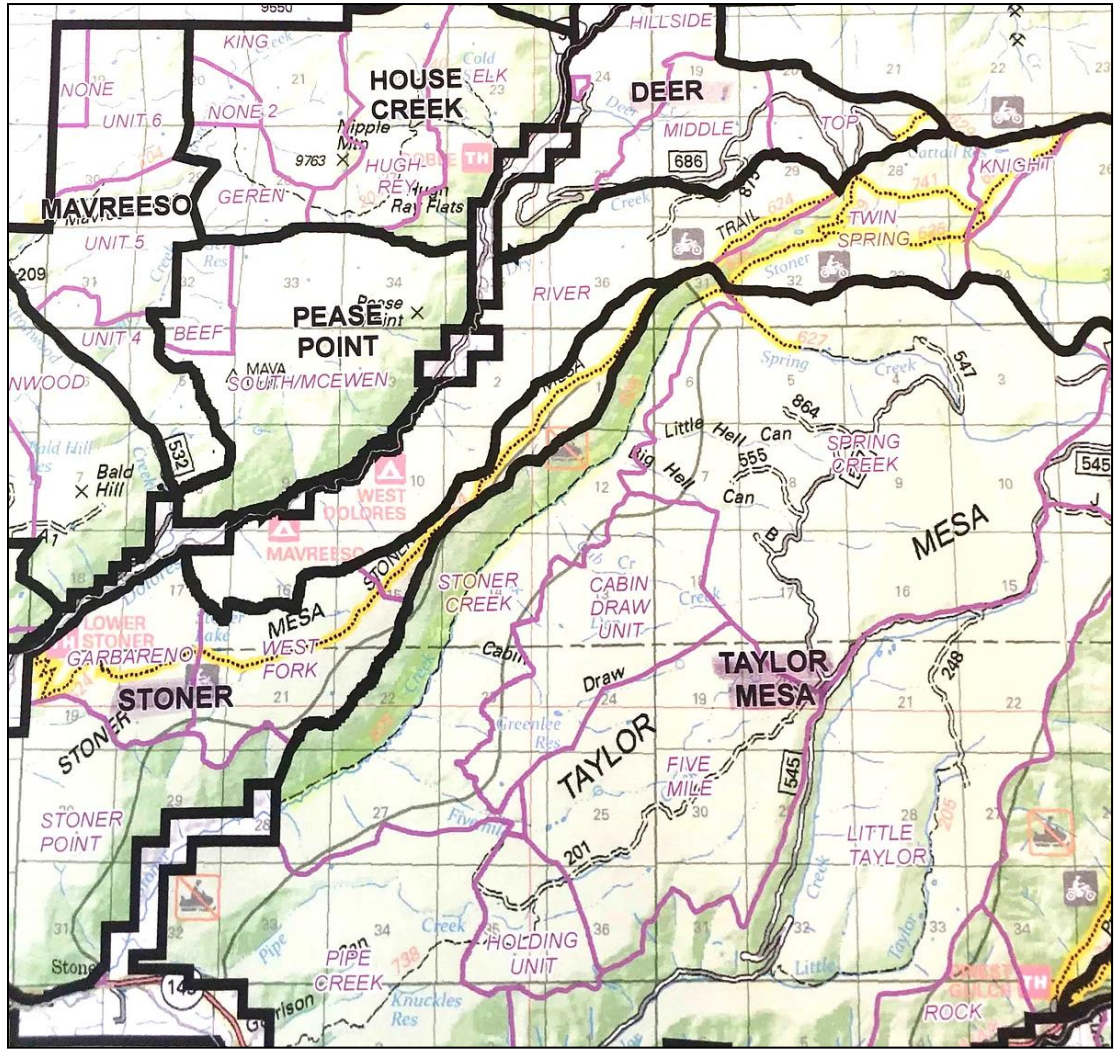
- "The existing quality for each of the following parameters is equal to or better than that specified…"
  - 12 water quality parameters must be rigorously measured against defined maximum threshold levels. Sampling is done across four seasons. Historic records are also considered.
- The waters constitute an outstanding natural resource, based on the following:
  - (A) The waters are a significant attribute of a State Gold Medal Trout Fishery, a National Park, National Monument, National Wildlife Refuge, or a designated Wilderness Area, or are part of a designated wild river under the Federal Wild and Scenic Rivers Act; or
  - (B) The Commission determines that the waters have exceptional recreational or ecological significance, and have not been modified by human activities in a manner that substantially detracts from their value as a natural resource.
- The water requires protection in addition to that provided by the combination of water quality classifications and standards and the protection afforded reviewable water under section 31.8(3).

Our OW structure

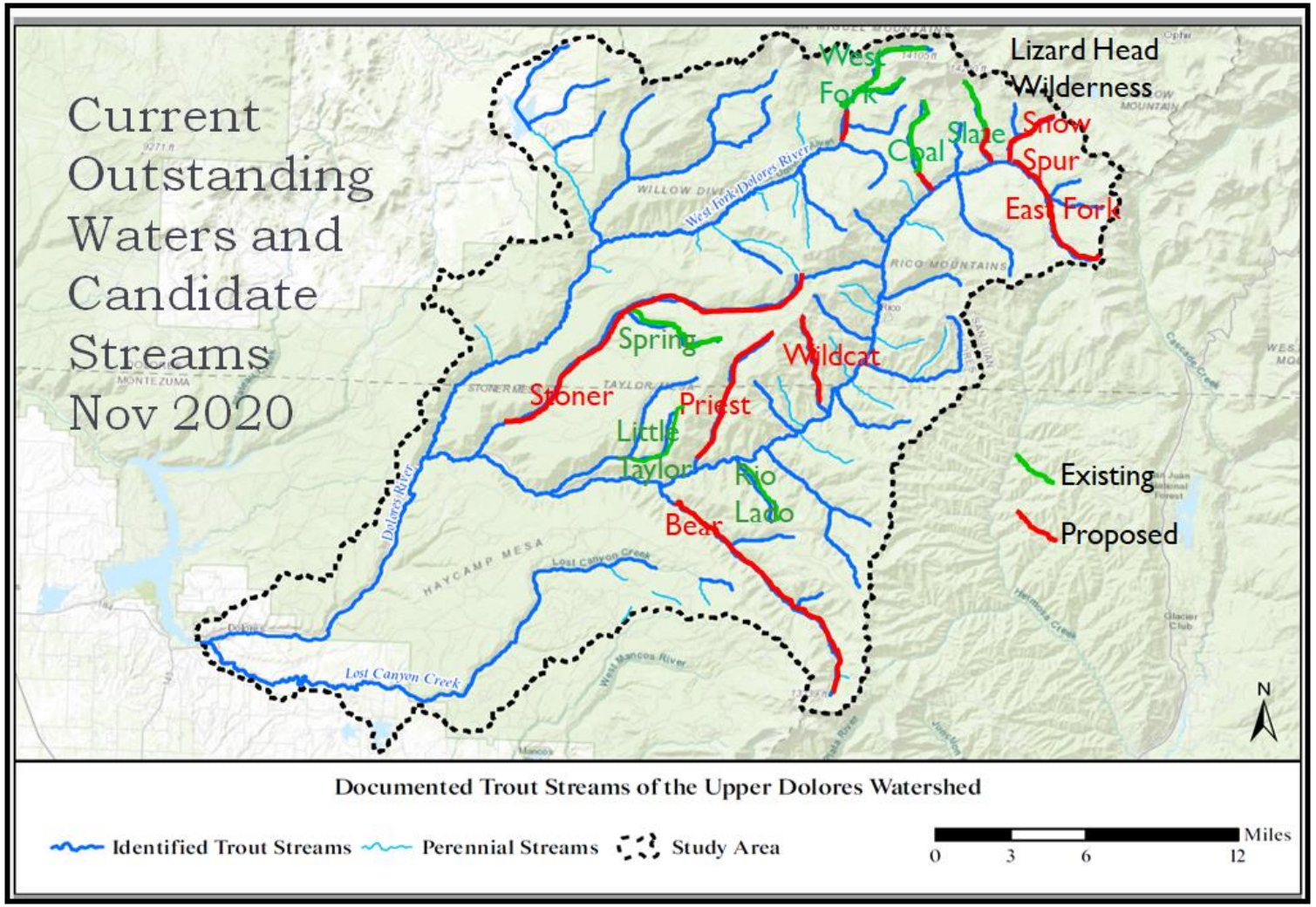
- DRA/CTU/TU is the proposal sponsor for the nine candidate stream reaches
- In informal collaboration with (funding, process, sampling protocol, outreach):
  - American Rivers
  - American Whitewater
  - Colorado Trout Unlimited/Dolores River Anglers/Trout Unlimited
  - Conservation Colorado
  - High Country Conservation Advocates
  - Mountain Studies Institute
  - San Juan Citizens Alliance
  - The Pew Charitable Trusts
  - Trout Unlimited
  - Western Resource Advocates.

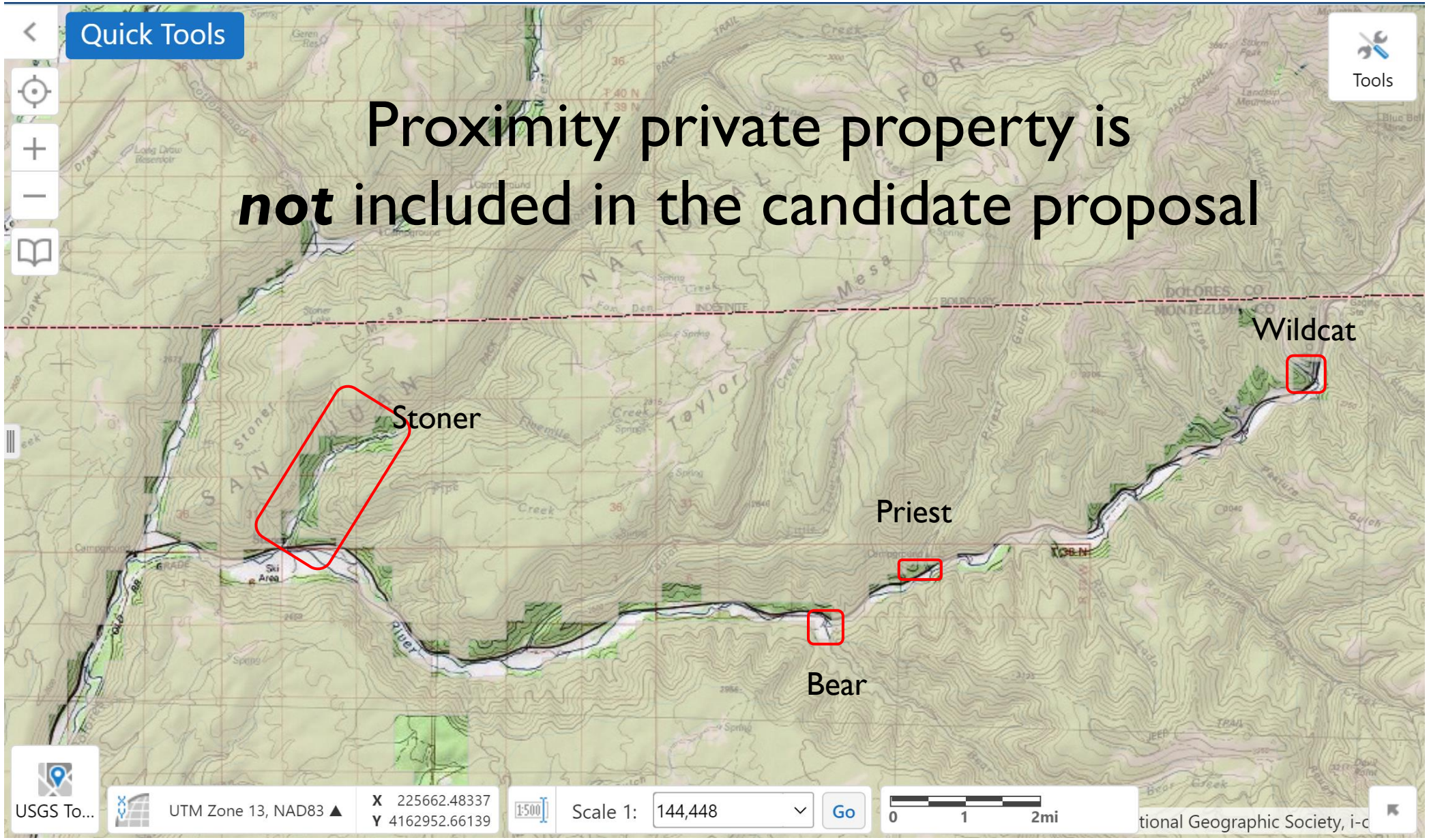
Potential issues

- Grazing
- Winter sampling
- Proximity private parcels

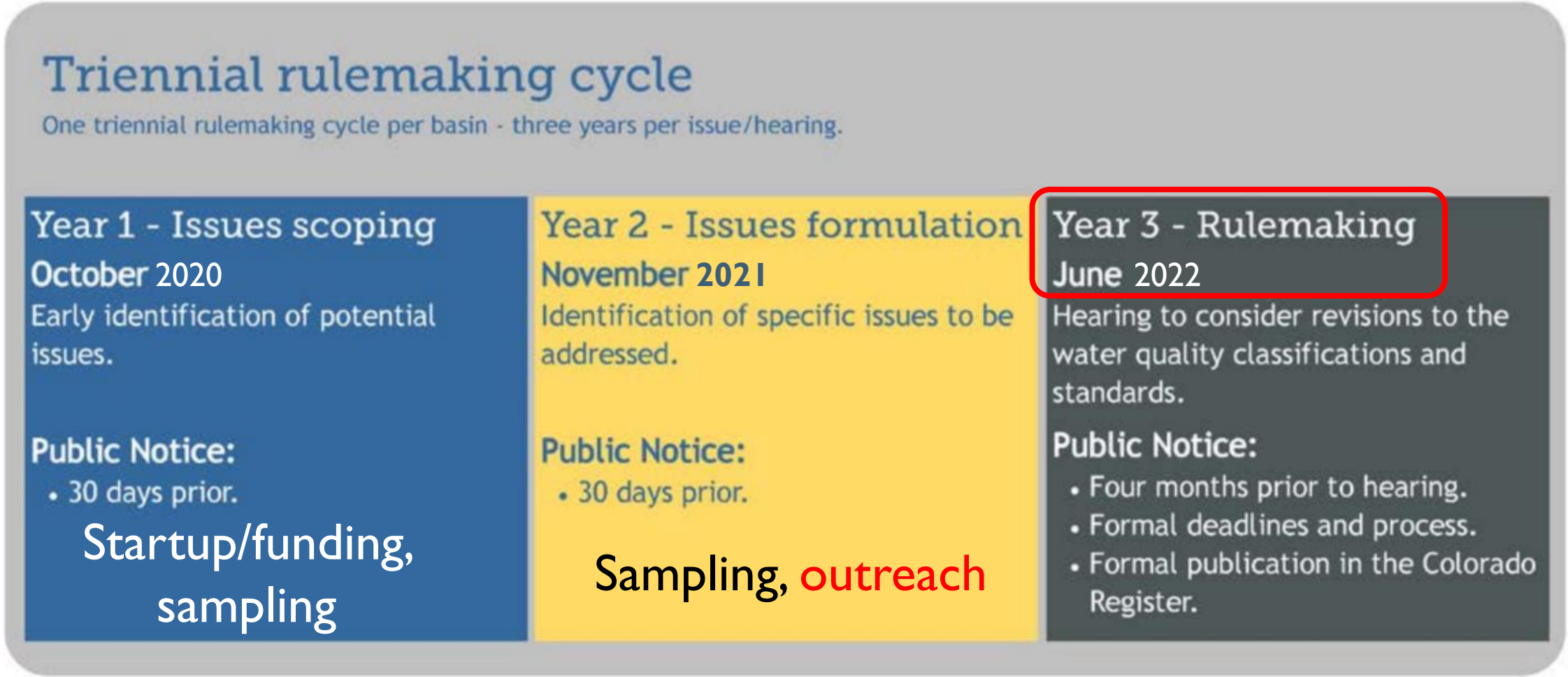


Winter sampling will be a bit “exciting”



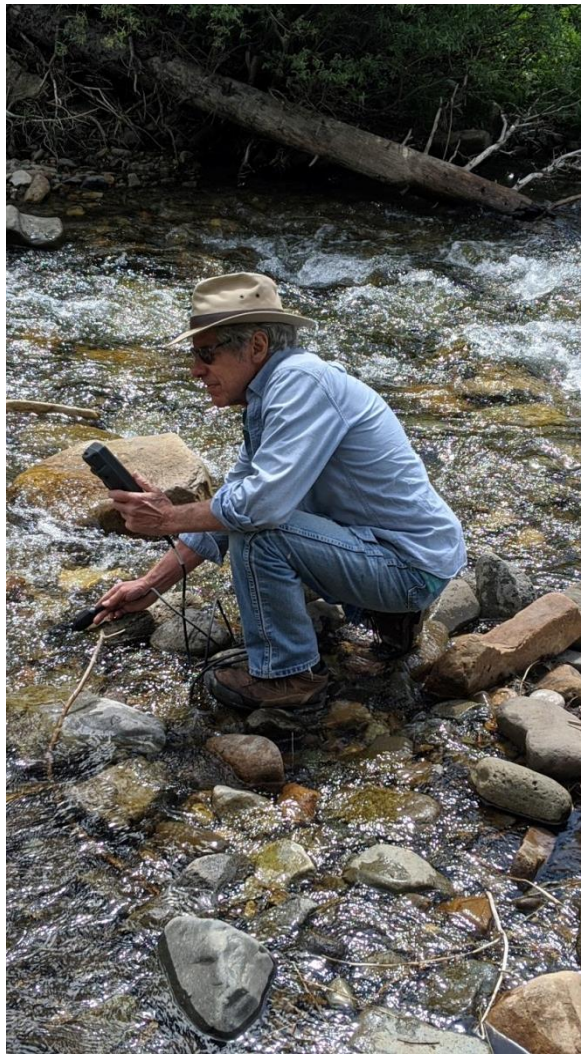

Quick Tools
Tools
Proximity private property is
not included in the candidate proposal
Wildcat
Stoner
Priest
Bear
USGS To...
UTM Zone 13, NAD83
X 225662.48337
Y 4162952.66139
Scale 1: 144,448
Go
0 1 2mi

Outstanding Waters process calendar (CO Water Quality Commission)

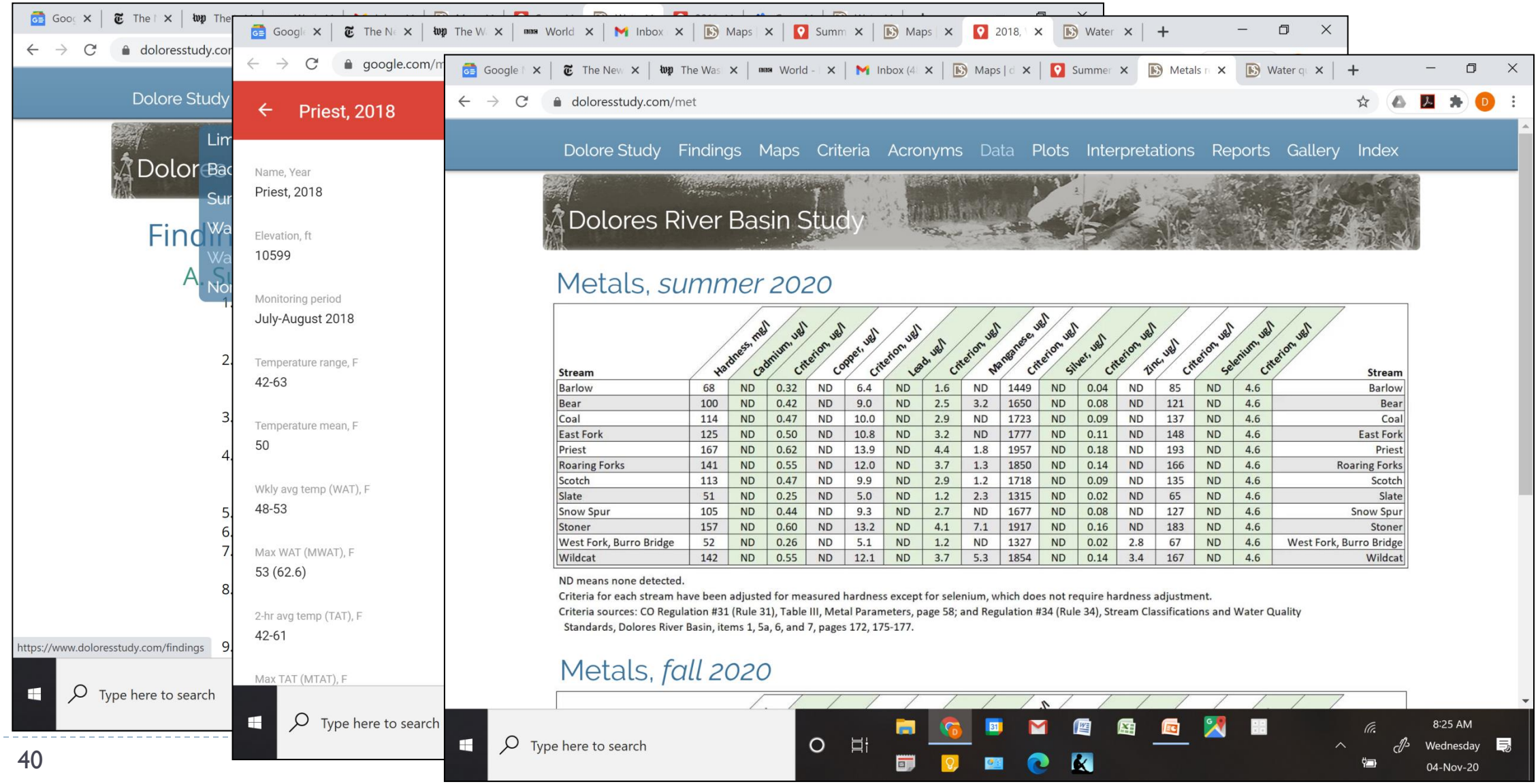


Sampling of the nine candidate reaches is underway

- Four seasonal samples (summer, low water, winter, high water)
- pH, DO, E. coli, nitrate, ammonia, calcium, copper, lead, manganese, silver, zinc, selenium



Our data, findings, and reports: DoloresStudy.com & .org



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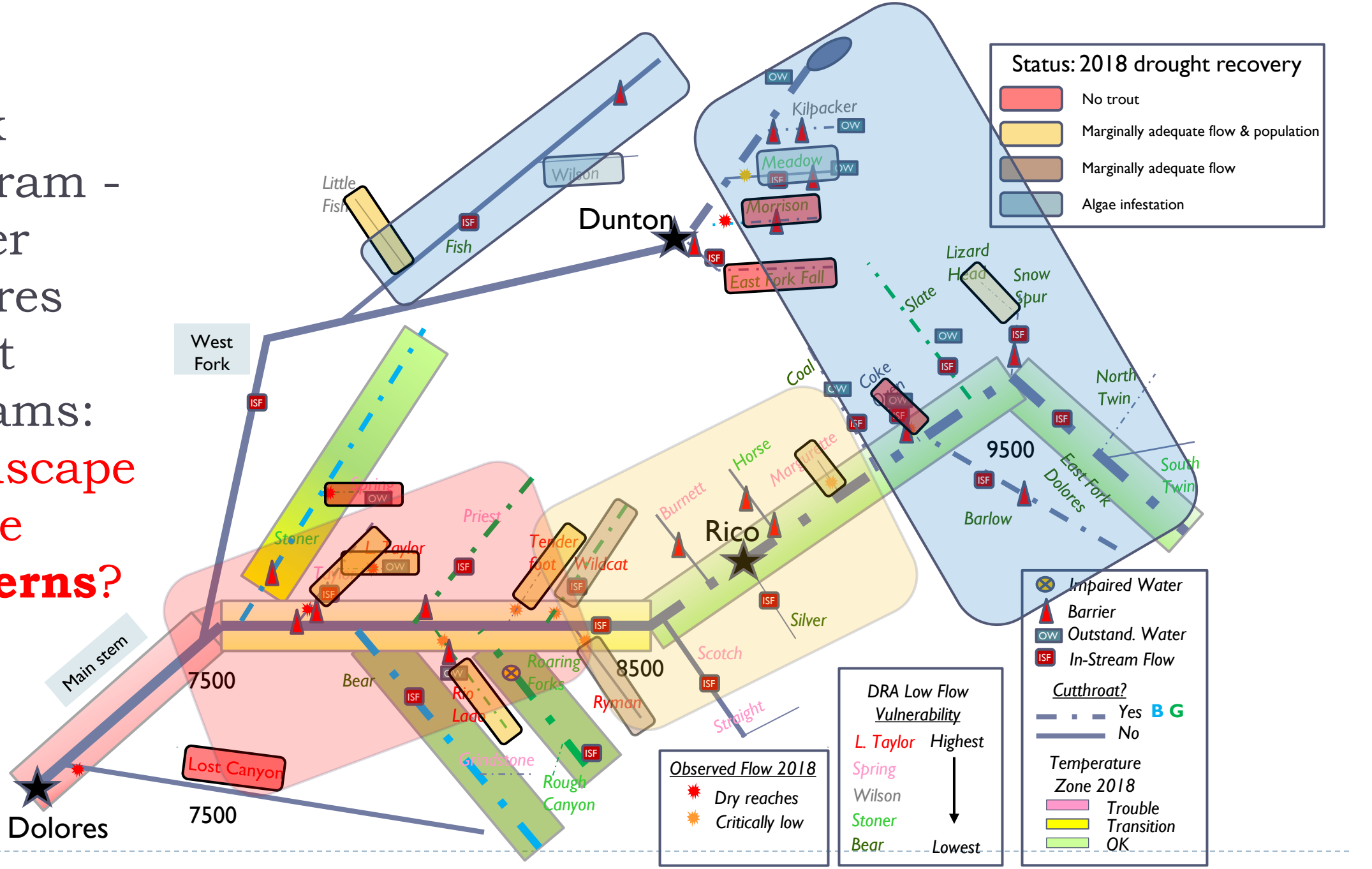
Where we were…

UDSPWG Session 4

Stick Diagram - Upper Dolores Trout Streams: Landscape -scale **Patterns**?

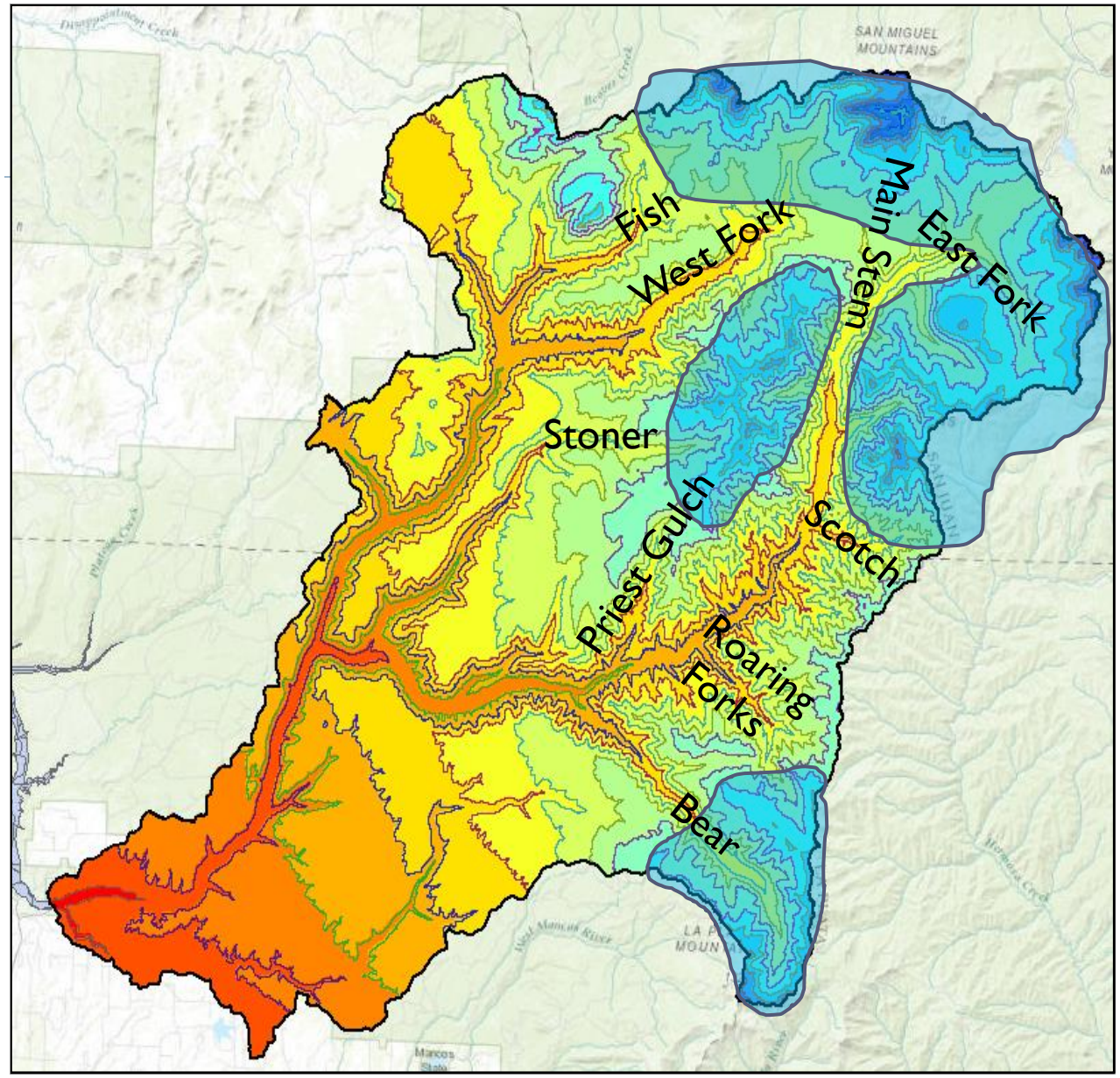


Ecosystem/population "suitability" transition zones

- Lost zone – ecosystem exceeds threshold levels, no longer suitable for target population/ecosystem
  - Minimal capital investment if any; maintenance investment only, if any, until clear that dissipation is "permanent" ("Letting go")
- Threatened zone – population is approaching threshold levels, stressed
  - Focus on resilience treatments at levels relative to expected dissipation "date"
  - Future-suitable species introduction for testing? ("Extend, resist, then let go")
- Persistent zone – population is within all threshold levels, thriving
  - Long-term investment (capital and maintenance) in both resistance and resilience ("Sustain, strengthen")
- Emergent zone – ecosystem outside threshold levels changes, moves inside, populations occupy
  - Focus on resilience treatments at levels relative to expected dissipation "date"
  - Set up monitoring/research to assess threshold limits ("Test, learn")
- Zones transition from one to another over time ("leading edge"/"trailing edge")

Core ideas applied

- Hard reality: It is likely that not all streams/habitat will survive to the end of the century.
- Action/investment should be conditioned by expected vulnerability to long-term disturbances.
- Long-term action/investment should be focused on
  - 1. streams whose headwaters reach to high elevations, and
  - 2. streams supported by large watersheds that are, ideally, at high elevation.
- Action/investment levels (strategic, routine) should just match expected life/vulnerability.



Priority Levels" by stream and trout type

STREAM NAME	Habitat Resist/Resil Level
Slate Creek	1
Roaring Forks Creek	1
Stoner Creek	1
Priest Gulch	1
Twin Creek North	1
East Fork Dolores River	1
Twin Creek South	1
Coal Creek	1
Barlow Creek	1
Bear Creek	1
Snow Spur Creek	1
Upper Dolores (#5)	1
Dolores River West Fk	1
Lizard Head Creek	1
Kilpacker Creek	1
Scotch Creek	1
Fish Creek @ SWA	1

Rough Canyon	2
Wildcat Creek	2
Lost Canyon (above Dipping Vat Creek)	2
[illegible]querite Creek	2
[illegible]	2
Silver C[illegible]Rico pond)	2
Meadow Creek	2
Horse Creek	2
Willow Creek	2
Fish Creek Little (#1)	
Spring Creek	
Rio Lado	3
Taylor Creek Little	3
Morrison Creek	3
Burnett Creek	3
Coke Oven Creek	3
Nash Creek	3
Upper Groundhog Creek (#2)	3
Fall Creek East Fk	3
Fall Creek (Dunton)	3
Bear Creek Little	3
Grindstone Creek	3
Tenderfoot Creek	3
Lower Dolores (#4)	3
Ryman Creek	3
Lost Canyon Creek (All)	3
Straight Creek	3
Clear Creek	3

Column 1

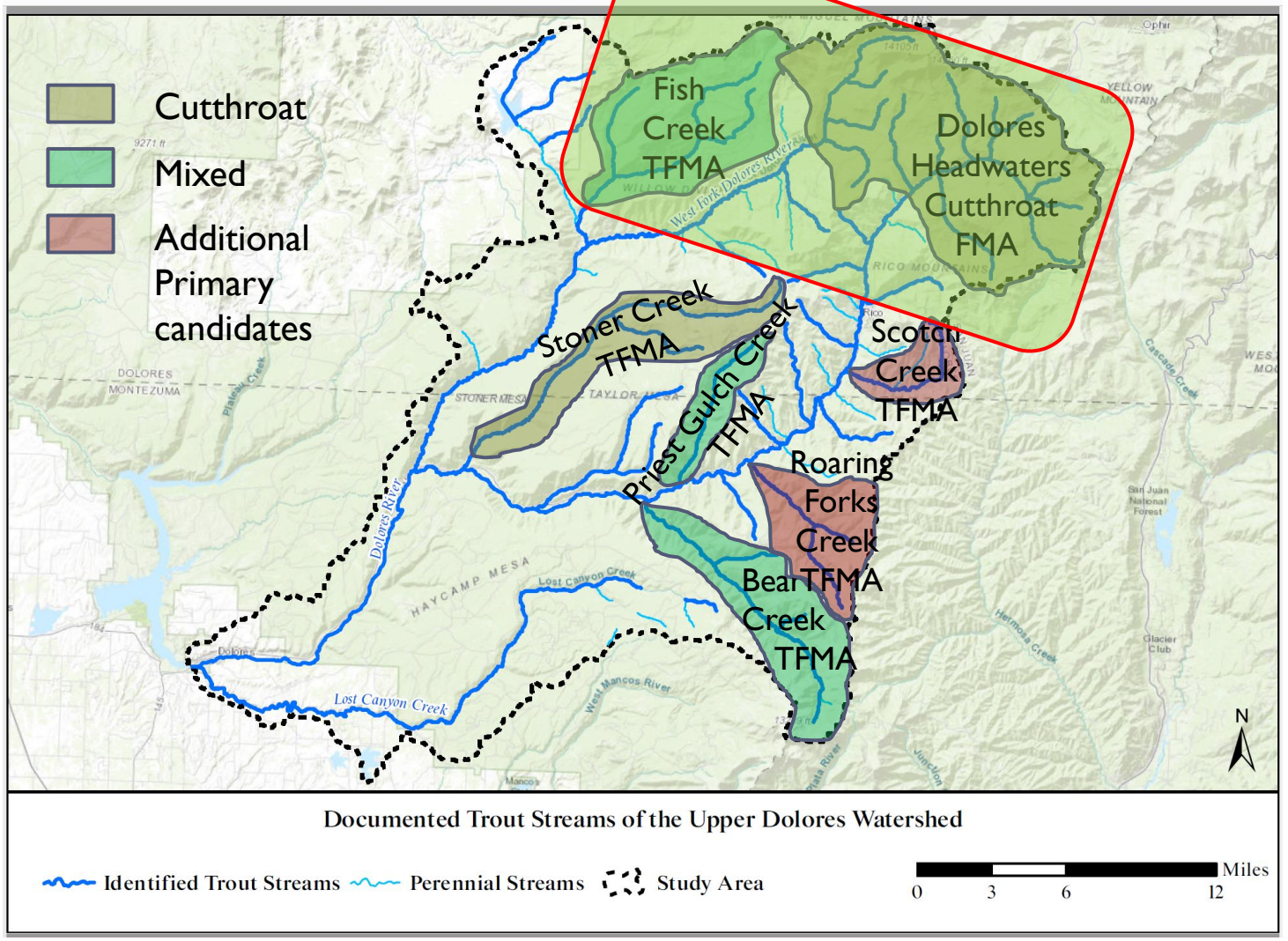
- Green lineage
- Blue lineage
- Unknown lineage
- Wild
- Unknown

Column 2. Habitat Resistence/ Resilience Levels:

1. Will likely persist through end of century (2100) (strongholds - most resilient)
2. Will likely dissipate between mid to end of century (2050 – 2100)
3. Will likely dissipate before or around mid century (2040 – 2060) (least resilient)

Discussion draft: landscape-scale "big picture" Level 1 priority "Fisheries Management Areas"

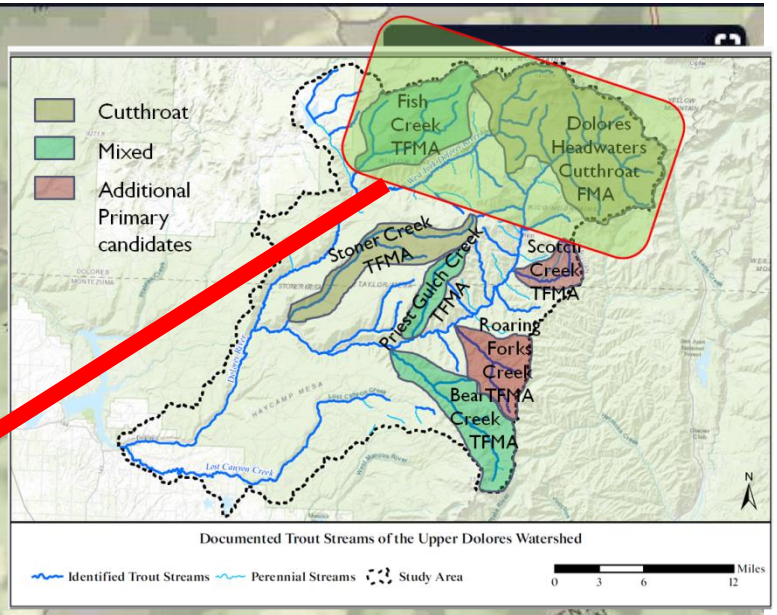
- Trout streams that are likely to survive through the end of the century
  - ***Large watersheds with***
  - ***High head waters***
- Sub priority: streams with cutthroat trout
- Maybe these become the "long-term resource investment fisheries"



Trout Streams:
Upper West Fork
Kilpacker Creek
Meadow Creek
Morrison Creek
Fall/East Fall Creek

Dolores River Headwaters Cutthroat Fisheries SMA

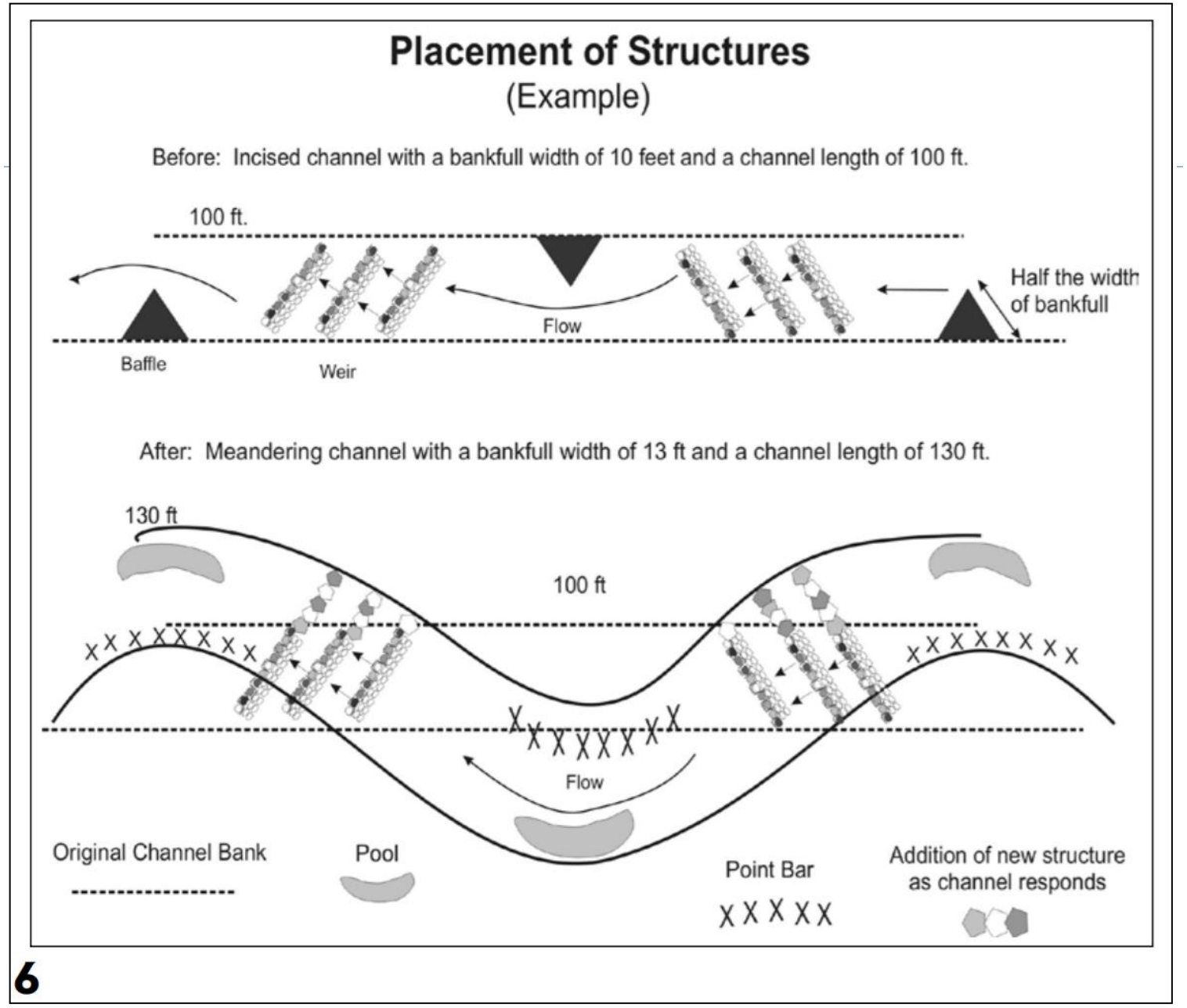
Trout Streams:
East Fork Dolores
South Twin Creek
Upper West Fork
Lizard Head Creek
Snow Spur Creek
Slate Creek
Barlow Creek
Coke Oven Creek
Coal Creek



Landscape scale perspective reduces the risk of losing entire an population due to a very large wildfire.

https://streamstats.usgs.gov/ss/

What is in the tool box? Dewatering mitigation: stream modifications – "slow the water down"



https://allaboutwatersheds.org//library/general-library-holdings/InducedMeanderingFieldGuide_000.pdf

Dewatering mitigation: beavers/”beaver analogs”

How and when to move forward?

UDSPWG Session 4

Thanks!